

Convection Pass Lower Header Closure Plate Cracking

Purpose

This bulletin advises owners to inspect for cracks in closure plates and wall tubes located in the convection pass lower header area of UP and RB boilers.

Problem

Closure plate cracking has occurred between adjacent lower convection pass headers at membrane panel splits. Figure 1 shows the general location of this cracking. In some cases, cracks have propagated into the tube wall resulting in tube failures. Figure 2 shows the typical closure plate design between headers and an example of the cracking. This cracking is usually quite advanced before tube leaks develop.

Background

B&W has supplied membrane-tube wall panels with shop-attached, closed-end headers for convection pass enclosures for more than 25 years. Temperature differentials that occur during unit startup or shut-down can result in high thermal stresses, which can cause cracks to form at the closure plate between headers. If cracking is observed, tubing and closure plates should be repaired or replaced. Then, reinforcing bars should be applied (see Figure 3) to limit movement between headers and prevent closure plate crack formation. This modification has proven to be successful on units where crack formation had been experienced.

Recommendations

A visual inspection from inside the convection pass enclosure should be made to determine if cracking is present and to what extent. If repairs are required, exterior lagging and insulation around the header ends will need to be removed. If the closure plate is cracked, it should be replaced. If cracking has propagated into the tubing, the affected tubing should be replaced.

(continued on reverse side)

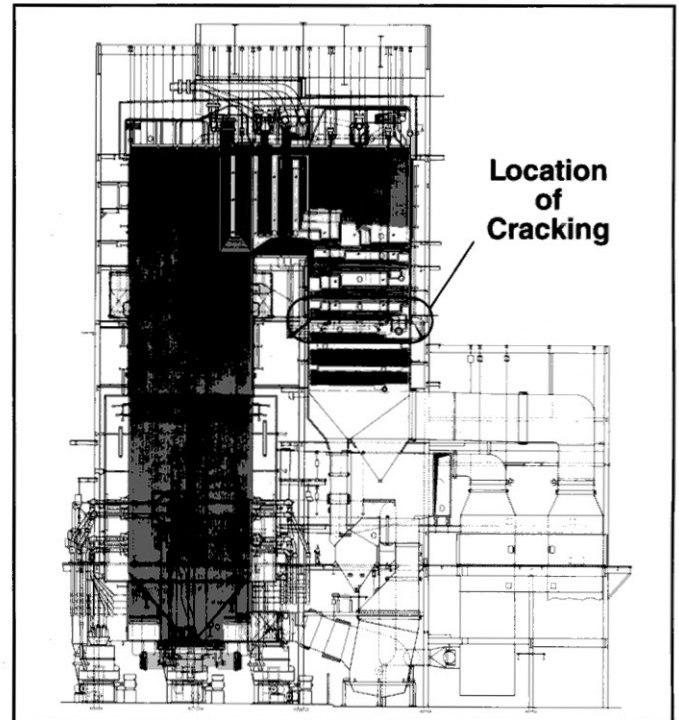


Figure 1 Location of closure plate cracking.

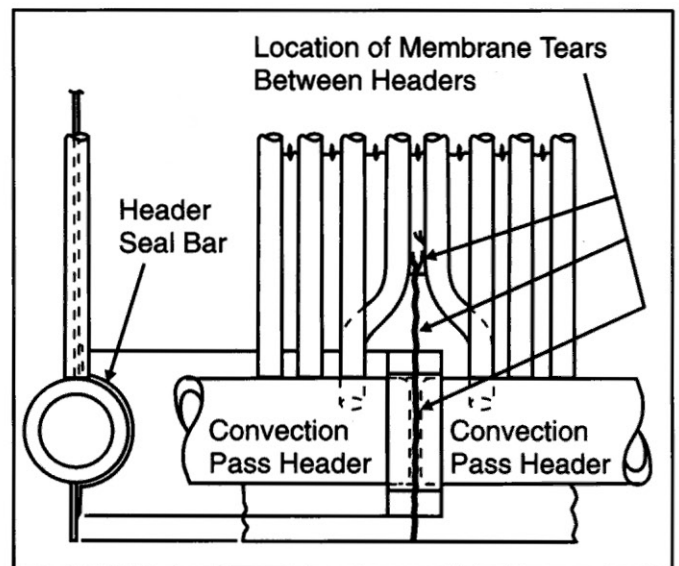


Figure 2 Typical closure plate with cracking.

As shown in Figure 3, modification to this area requires the addition of four reinforcing bars welded to the headers. (Attempts to weld two reinforcing bars to the headers on the gas side only have not been successful.) Once repaired, the areas should be inspected on a regular basis to assure that the cracking has been stopped.

To extend pressure part component life and to reduce seal/casing maintenance, conservative rates of temperature change should be practiced during unit startup and shutdown. As a minimum, the rates of temperature change and procedures for heating up

and cooling down the unit (as recommended in the unit's operating instructions) should be followed.

Support

Contact B&W Field Service Engineering through your local District Service Office to coordinate your inspection and repair efforts. A Field Service Engineer can assist in reviewing your operational practices to determine if temperature differentials during startup and shutdown need to be reduced. If required, modified procedures can be developed to extend component life and reduce maintenance.

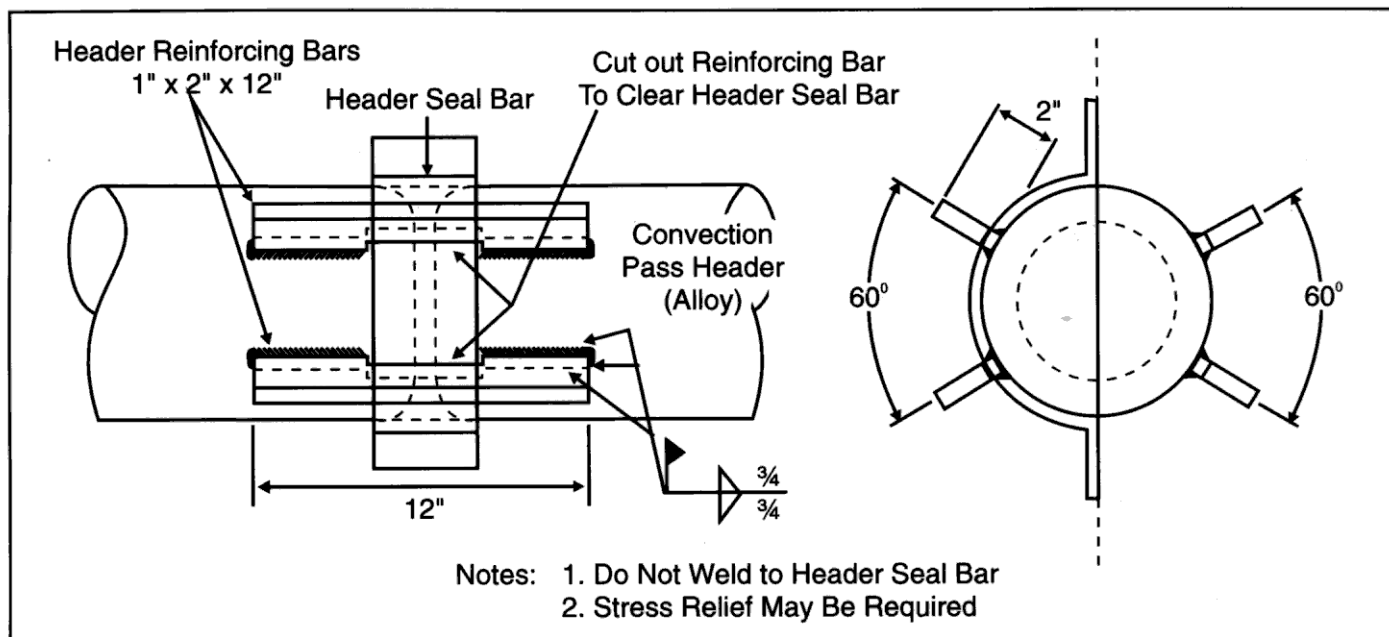


Figure 3 Inlet header reinforcing bars in the convection pass enclosure limit movement between the headers and prevent closure plate crack formation.

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